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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/493,091

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Patrick Brindel

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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 

09/493,091

Applicant(s)

BRINDEL ET AL.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 10 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-2, 5 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Roberts et al. (U.S. Patent 6,067,179).

Regarding claim 1, Roberts et al. discloses in FIG. 6 an optical transmission system comprising transmitters Tx1 to Tx4, receivers Rx1 to Rx4, and optical transmission line for connecting the transmitters and receivers. The optical transmission line includes optical fiber 62 and 63 and bi-directional amplifiers 52 and 53. Roberts et al. teaches in FIG. 4 structure of a bi-directional amplifier comprising a set of channel regenerators 40. The set of channel regenerators comprises regenerator for blue channels and regenerator for red channels. Blue channels and red channels are non-overlapping as illustrated in FIG. 5. The number of channels and wavelength for each channel are predetermined.

Regarding claim 2, Roberts et al. teaches in FIG. 5 that the number of blue channels are the same as the number of red channels in each example. That is, the number of total channels is an even number. Since there are two regenerators (one blue regenerator and one red regenerator), the number of channel regenerators is a submultiple of the number of channels.

Regarding claim 5, Roberts et al. teaches in FIG. 5 that each group includes a plurality of channels.

Regarding claim 8, Roberts et al. teaches in FIG. 4 demultiplexer 44 and multiplexer 45 so that channels which are not to be regenerated by the red regenerator do not go to the red

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regenerator and channels which are not to be regenerated by the blue regenerator do not go to the blue regenerator.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-4, 15-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggleton et al. (U.S. Patent 6,370,300 B1) in view of Shimomura et al. (U.S. Patent 6,400,498 B1).

Regarding claim 1, Eggleton et al. discloses in FIG. 2 a WDM fiber optic transmission system comprising transmitter 10, receiver 12 and an optical line connecting the transmitter and receiver. The optical line comprises fiber 11 and amplifier (regenerator) 13. The difference between Eggleton et al. and the claimed invention is that Eggleton et al. does not teach a plurality of amplifiers. Shimomura et al. teaches in FIG. 26 an optical signal repeating and amplifying device comprising a set of amplifiers (regenerators) where each amplifier regenerates one channel. That is the channel regenerated by each regenerator forms a non-overlapping subset of the channels to be regenerated. One of ordinary skill in the art would have been motivated to combine the teaching of Shimomura et al. with the WDM transmission system of Eggleton et al. because the repeating and amplifying device of Shimomura et al. removes ASE noise and can also equalization optical levels (see col. 22, lines 50-52 of Shimomura et al.). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use one amplifier for each channel, as taught by Shimomura et al., in the WDM

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transmission system of Eggleton et al. because the repeating and amplifying device of Shimomura et al. removes ASE noise and can also equalization optical levels.

Regarding claim 2, Shimomura et al. teaches to have the same number of regenerators as the number of channels. Therefore, the number of regenerators is a submultiple of the number of channels.

Regarding claims 3 and 15-17, Shimomura et al. teaches to have one channel in each group. The number of regenerators equals to the number of channels.

Regarding claim 4, Shimomura et al. teaches optical regenerators.

Regarding claim 19, Shimomura et al. teaches in FIG. 26 that channels regenerated by amplifier 261 is not regenerated by regenerators 262, 263 and 264.

Regarding claim 20, Shimomura et al. teaches in FIG. 26 that each channel is regenerated by one and only one regenerator.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (U.S. Patent 6,067,179) in view of Cao (U.S. Patent 6,396,607 B1).

Roberts et al. has been discussed above in regard to claims 1-2 and 5. The difference between Roberts et al. and the claimed invention is that Roberts et al. does not teach means for synchronizing a plurality of channels. Cao teaches in FIG. 1 an optical regenerator that synchronizes and regenerates a plurality of channels. One of ordinary skill in the art would have been motivated to combine the teaching of Cao with the optical transmission system of Roberts et al. because the optical regenerator of Cao supports high speed channels. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an

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optical regenerator for red band channels, as taught by Cao, in the optical transmission system of Roberts et al. because the optical regenerator of Cao supports high speed channels.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eggleton et al. and Shimomura et al. as applied to claims 1-4, 15-17 and 19-20 above, and further in view of Yano (U.S. Patent 6,108,125).

Eggleton et al. and Shimomura et al. have been discussed above in regard to claims 1-4, 15-17 and 19-20. The difference between Eggleton et al. and Shimomura et al. and the claimed invention is that Eggleton et al. and Shimomura et al. do not teach a synchronous modulator. Yano teaches in FIG. 6 an optical repeater with EA modulator 210 for reshaping, retiming and regenerating optical signal. One of ordinary skill in the art would have been motivated to combine the teaching of Yano with the modified WDM transmission system of Eggleton et al. and Shimomura et al. because the repeater of Yano retimes the signal for removing jitters in addition to reshaping the signal. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical repeater of Yano in the modified WDM transmission system of Eggleton et al. and Shimomura et al. because the repeater of Yano retimes the signal for removing jitters in addition to reshaping the signal.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (U.S. Patent 6,067,179) in view of Bo et al. (W. Bo et al., "Fiber Gratings Based Optical Add/Drop Multiplexer with Low Interferometric Crosstalk", International Conference on Communication Technology, ICCT'98, October 22-24, 1998).

Roberts et al. has been discussed above in regard to claims 1-2 and 5. The difference between Roberts et al. and the claimed invention is that Roberts et al. uses a

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multiplexer/demultiplexer to separate the channel and recombine the channels while the claimed invention uses inserter/extractor for isolating channels. Bo et al. teaches in FIG. 2 an OADM which can be used to extract/insert one or more specific channel from a WDM system. One of ordinary skill in the art would have been motivated to combine the teaching of Bo et al. with the optical transmission system of Roberts et al. because the OADM is ideal for extracting a small number of channels and has low insertion loss and good isolation. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an inserter/extractor to isolate the channels and recombine the channels, as taught by Bo et al., in the transmission system of Roberts et al. because an inserter/extractor has low insertion loss and good isolation.

8. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (U.S. Patent 6,067,179) in view of Kinoshita (U.S. Patent 6,023,366).

Roberts et al. has been discussed above in regard to claims 1-2 and 5. The difference between Roberts et al. and the claimed invention is that Roberts et al. does not teach supervisory channel. Kinoshita teaches in FIG. 1 to use a dedicated channel λ_{SV} for supervisory purpose. One of ordinary skill in the art would have been motivated to combine the teaching of Kinoshita with the transmission system of Roberts et al. because a supervisory channel can be used to convey information about channels for the payload and monitor the status of amplifiers and repeaters. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a dedicated channel for supervisory purpose, as taught by Kinoshita, in the transmission system of Roberts et al. because a supervisory channel can be used

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to convey information about channels for the payload and monitor the status of amplifiers and repeaters.

Regarding claim 12, Kinoshita teaches in FIG. 1 means 24 for separating the dedicated channel.

Regarding claim 13, Kinoshita teaches in FIG. 2 the delivery of optical output signal to the supervisory unit.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (U.S. Patent 6,067,179) in view of Chraplyvy et al. (U.S. Patent 5,847,862).

Roberts et al. has been discussed above in regard to claims 1-2 and 5. The difference between Roberts et al. and the claimed invention is that Roberts et al. does not teach the arrangement of amplifiers and regenerators such that the spacing of optical regenerators is a multiple of the spacing of the optical amplifiers. Chraplyvy et al. teaches in FIG. 1 the position of a plurality of amplifiers between regenerators because fiber causes attenuation but introduces very little noise and, therefore, amplification of signal is required more often than regeneration of signal. One of ordinary skill in the art would have been motivated to combine the teaching of Chraplyvy et al. with the transmission system of Roberts et al. because the arrangement of Chraplyvy et al. minimize the placement of expensive regenerators. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to position multiple amplifiers between regenerators, as taught by Chraplyvy et al., in the transmission system of Roberts et al.

Allowable Subject Matter

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10. Claims 10 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments with respect to claims 1-7, 9, 11-17 and 19-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

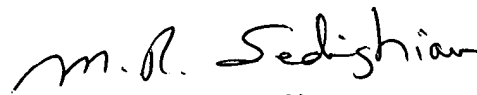
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl
11 March 2005


M. R. SEDIGHIAN
PRIMARY EXAMINER